भारतीय मानक
Indian Standard

IS 17517 : 2021

पायरीप्रोक्सीफेन + फेनप्रोपेथ्रीन इम्यूलसीफियबल सांद्र (ई.सी.) — विशिष्टि

Pyriproxyfen + Fenpropathrin Emulsifiable Concentrate (EC) — Specification

ICS 65.100.30

© BIS 2021

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

March 2021 **Price Group 2**

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Pesticides and Pesticides Residues Sectional Committee had been approved by the Food and Agriculture Division Council.

Pyriproxyfen + Fenpropathrin EC is used as an insecticide in agriculture.

Pyriproxyfen + Fenpropathrin EC is generally manufactured to contain a mixture of 5 percent (*m/m*) of pyriproxyfen and 15 percent (*m/m*) of fenpropathrin.

In the formulation of this standard, due consideration has been given to the provisions of *Insecticides Act*, 1968 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under the *Insecticides Act* and Rules, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding-off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PYRIPROXYFEN + FENPROPATHRIN EMULSIFIABLE CONCENTRATE (EC) — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for Pyriproxyfen + Fenpropathrin, EC.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1070 : 1992	Reagent grade water — Specification (*third revision*)
1448 [P : 20] : 2019	Methods of test for petroleum and its products: [P : 20] Determination of flash point — Abel closed-cup method (*third revision*)
6940 : 1982	Methods of test for pesticides and their formulations (*first revision*)
8190 (Part 2) : 1988	Requirements for packing of pesticides: Part 2 Liquid pesticides (*second revision*)
9503 : 1988	Specification for aluminium bottles for liquid pesticides (*first revision*)
9992 : 1991	Round and rectangular tinplate cans for liquid pesticides — Specification (*first revision*)
10627 : 1983	Methods for sampling of pesticidal formulations
15161 : 2002	Fenpropathrin technical — Specification
16141 : 2013	Pyriproxyfen, technical — Specification

3 REQUIREMENTS

3.1 Constituents

3.1.1 The material shall consist of pyriproxyfen, technical and fenpropathrin, technical dissolved in suitable solvent(s) together with emulsifying agent(s). Pyriproxyfen, technical and fenpropathrin, technical employed in the manufacture of the material, shall conform to IS 16141 and IS 15161, respectively.

3.2 Physical

3.2.1 *Description*

The material shall be clear, homogeneous and stable liquid, pale yellowish in colour, free from sediment and/or suspended matter. It shall readily form an emulsion, on dilution with water, suitable for spray.

3.2.2 *Cold Test*

No turbidity or separation of solid or oily matter shall occur when the material is subjected to the cold test at 10 °C as prescribed in **13.1** of IS 6940 or any other lower temperature as agreed to between the purchaser and the supplier.

3.2.3 *Flash Point (Abel)*

When determined by the method prescribed in IS 1448 [P : 20], the flash point of the material shall be above 24.5 °C.

3.2.4 *Emulsion Stability*

Any separation including creaming at the top and sedimentation at the bottom of 100 ml emulsion prepared in standard hard water with 2.0 ml of EC, shall not exceed 2.0 ml when tested by the method prescribed in **13.3** of IS 6940.

3.3 Chemical

3.3.1 When determined by the method prescribed in Annex A, the observed pyriproxyfen and fenpropathrin content, percent (*m/m*) of any of the samples shall not differ from the declared nominal value by more than the percent tolerance limits given below:

Nominal Value	*Tolerance Limits*	
Percent	Percent	
Up to 9	+ 10	of the nominal value
	– 5	
Above 9 and below 50	± 5	
50 and above	+ 5	
	– 3	

3.3.2 *Acidity*

When determined by the method prescribed in **13.5** of IS 6940, acidity (as H_2SO_4) of the material shall not be more than 0.5 percent by mass.

4 PACKING

The material shall be packed in tin plate containers conforming to IS 9992 or aluminium containers conforming to IS 9503. The container shall also meet the general requirements given in 8190 (Part 2).

5 MARKING

5.1 The containers shall be securely closed and the following information shall be marked legibly and indelibly on each container in addition to any other information as is necessary under the *Insecticides Act*, 1968 and Rules framed thereunder:

a) Name of the material;
b) Name and address of the manufacturer;
c) Batch number;
d) Date of manufacture;
e) Date of expiry;
f) Net quantity;
g) Pyriproxyfen + Fenpropathrin content, percent (*m/m*);
h) Cautionary notice worded as in the *Insecticides Act*, 1968 and Rules framed thereunder; and
j) Any other information required under the *Legal Metrology (Packaged Commodities) Rules,* 2011.

5.2 BIS Certification Marking

The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

When freshly manufactured material in bulk quantity and/or the retail pack of the formulated product is/are offered for inspection, representative sample of the material shall be drawn as prescribed in IS 10627 and if tested within 90 days of its date of manufacture, the criteria for conformity shall be the contents in percent (*m/m*), shall not be less than the declared nominal value. The upper limit for conformity shall be the same as those given in **3.3.1**.

When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627, however, the criteria for conformity of the material, when tested, shall be the limits of tolerances, as applicable over the declared nominal value and given under **3.3.1** of this standard.

7 TESTS

7.1 Tests shall be carried out by the methods referred to in **3.2.2** to **3.2.4, 3.3.1** and **3.3.2.**

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals and reagent grade water (*see* IS 1070) shall be employed in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities, which affect the results of analysis.

ANNEX A

(*Clause* 3.3.1)

DETERMINATION OF PYRIPROXYFEN AND FENPROPATHRIN CONTENT IN PYRIPROXYFEN AND FENPROPATHRIN EC FORMULATION SAMPLE

A-1 PRINCIPLE

The pyriproxyfen and fenpropathrin content are determined simultaneously by gas chromatography using internal standard technique.

A-2 APPARATUS

A-2.1 Gas chromatograph (GLC) equipped with flame Ionization Detector (FID) and coupled to a printer-plotter-cum-integrator or PC based data system is used for this determination. The suggested operative parameters are as follows, but can be changed, if necessary, provided standardization is done**:**

Column:	Dimethyl polysiloxane megabore column, 30 m length, 0.53 mm i.d., 1.5 µm thickness or equivalent.	
Temperature conditions:	Oven	260 °C
	Injection port	280 °C
	Detector	290 °C
Flow rates:	a) Nitrogen (carrier)	4 ml/min
	b) Hydrogen	40 ml/min
	c) Air (FID)	400 ml/min
Volume injected:	1 µl	
Injection mode split ratio	Split	1 µl
	Solvent	1 : 10

A typical chromatogram of pyriproxyfen and fenpropathrin with internal standard is given in Fig. 1

A-2.2 Microlitre Syringe – 10 µl capacity.

A-2.3 Standard Glassware

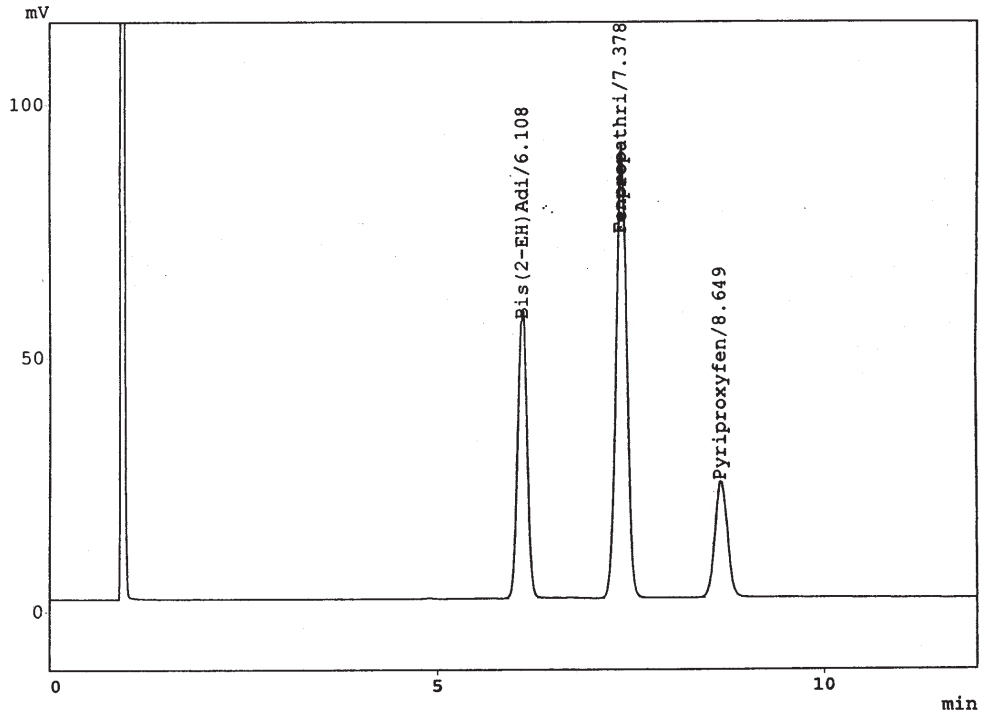

FIG. 1 A TYPICAL CHROMATOGRAM

A-3 REAGENTS

A-3.1 Acetone — AR grade or equivalent.

A-3.2 Internal Standard — Bis (2-ethylhexyl) adipate **—** AR grade or equivalent.

A-3.3 Pyriproxyfen Reference Standard, of known purity.

A-3.4 Fenpropathrin Reference Standard, of known purity.

A-3.5 Sodium Hydroxide — AR grade or equivalent.

A-3.6 Methylene Red Indicator — AR grade or equivalent.

A-4 PROCEDURE

A-4.1 Preparation of Internal Standard Solution

Weigh approximately 1.2 g of Bis (2-ethylhexyl) adipate into a 100 ml volumetric flask. Dissolve in acetone and make up the volume upto the mark with acetone. Shake well to homogenize

A-4.2 Preparation of Standard Solution

Weigh accurately 75 mg of pyriproxyfen reference standard and 225 mg of fenpropathrin reference standard of known purity into a 50 ml volumetric flask. Add 5 ml of Bis (2-ethylhexyl) adipate (internal standard) solution and make up the volume upto the mark with acetone. Shake well to homogenize

A-4.3 Preparation of Sample Solution

Weigh accurately a quantity of a sample so as to contain 75 mg of pyriproxyfen and 225 mg of fenpropathrin into a 50 ml volumetric flask. Add 5 ml of Bis (2-ethylhexyl) adipate (internal standard) solution and make up the volume upto the mark with acetone. Shake well to homogenize.

A-5 ESTIMATION

A-5.1 Inject 1 µl of reference standard solution until the area quotients of internal standard/reference standard of two successive chromatograms do not deviate from each other by more than 2 percent. Then use the following injection sequence:

… C, S_1, C, S_1, C, ……

where

C = standard solution, and

S_1 = sample solution

From the chromatograms of the standard solution and sample solution, measure the peak areas of the internal standard and pyriproxyfen/fenpropathrin peaks, and compute the percentage of pyriproxyfen/fenpropathrin as given in **A-6**.

A-5.2 Retention Times (Guide Values)

Bis (2-ethylhexyl) adipate (Internal Standard) :	4.8 min (approximately)
Fenpropathrin (Standard):	5.8 min (approximately)
Pyriproxyfen (Standard) :	6.8 min (approximately)
Total Run time:	8 min

A-6 CALCULATION

$$\text{Pyriproxyfen/fenpropathrin content, percent by mass} = \frac{M_1 \times A_3 \times A_2 \times P}{M_2 \times A_4 \times A_1}$$

where

M_1 = mass in g of standard pyriproxyfen/ fenpropathrin in standard solution;

M_2 = mass in g of the sample taken for test;

A_1 = peak area of pyriproxyfen/fenpropathrin in the chromatogram of standard solution;

A_2 = peak area of pyriproxyfen/fenpropathrin in the chromatogram of sample solution;

A_3 = peak area of internal standard in the chromatogram of standard solution;

A_4 = peak area of internal standard in the chromatogram of sample solution; and

P = percentage purity of pyriproxyfen/ fenpropathrin reference standard.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 01 (1940).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	2323 7617, 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi, KOLKATA 700054	2337 8499, 2337 8561, 2337 8626, 2337 9120
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, CHANDIGARH 160019	265 0206, 265 0290
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	2254 1216, 2254 1442, 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400093	2832 9295, 2832 7858, 2832 7891, 2832 7892

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN. DURGAPUR. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. JAMMU. JAMSHEDPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAIPUR. RAJKOT. VISAKHAPATNAM.

Published by BIS, New Delhi